

Application No. 10/634,651

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JAN 15 2009

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace prior versions and listings of claims in the application:

Claim 40 has been amended as follows: Underlines indicate insertions and ~~strikethrough~~ indicate deletions.

Listing of claims:

1. (withdrawn) Method for making a battery grade zinc powder, said method comprising the steps of:

- (a) providing a molten zinc metal or a molten zinc alloy;
- (b) subjecting said molten zinc metal or molten zinc alloy to impulse atomisation to produce a powder made up of solid particles of zinc metal or zinc alloy in the form of a battery grade zinc powder; and
- (c) recovering said battery grade zinc powder.

2. (withdrawn) The method of claim 1 wherein in step (b) the impulse atomisation has a frequency of between 20 and 1000Hz, a force applied to the plunger of between about 44.5 and 40 newtons, a plunger distance of between 1 to 7 mm and atomising apertures of between 40 and 500µm.

3. (withdrawn) The method of claim 2 wherein in step (b) said particles are cooled in an atmosphere comprising a gas selected from the group consisting of air, inert gas, oxygen and a mixture of 0 to 20% oxygen with the remainder being inert gas.

4. (withdrawn) The method of claim 3 wherein said inert gas is selected from the group consisting of nitrogen, helium, argon and any mix of nitrogen, helium and argon.

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5. (cancelled)

6. (previously presented) The anode of claim 40 wherein a major portion of said particles are teardrop.

7. (presently amended) The anode of claim 6 wherein said particles have an average length between about 250 μ m and 3000 μ m.

8. (cancelled)

9. (previously presented) The anode of claim 40 wherein a major portion of said particles are acicular or stranded.

10. (cancelled)

11. (cancelled)

12. (cancelled)

13. (presently amended) The anode of claim 40 wherein said particles have an average diameter between about 40 μ m and 1000 μ m.

14. (presently amended) The anode of claim 40 wherein said powder further comprises a second zinc metal or zinc alloy powder having different average characteristics in term of diameter and length.

15. (previously presented) The anode of claim 40 further comprising up to about 50% of a fine zinc metal or zinc alloy powder having a particle size of less than about 75 μ m.

16. (previously presented) The anode of claim 15 wherein said fine zinc metal or zinc alloy powder is fabricated from the same zinc metal or zinc alloy as said zinc particles.

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17. (previously presented) The anode of claim 15 comprising up to about 20% of said fine zinc metal or zinc alloy powder.

18. (presently amended) The anode of claim 40 further comprising up to about 50% of a second zinc metal or zinc alloy powder having an average length of about 2 times the diameter and a particle size distribution between about 54µm and about 425µm.

19. (cancelled)

20. (cancelled)

21. (previously presented) The anode of claim 40 wherein said zinc powder is a zinc alloy comprising zinc, bismuth and indium.

22. (previously presented) The anode of claim 21 wherein said zinc alloy comprises between about 50 to 1000 ppm bismuth.

23. (previously presented) The anode of claim 21 wherein said zinc alloy comprises between about 50 to 1000 ppm indium.

24. (previously presented) The anode of claim 21 wherein said zinc alloy comprises aluminum.

25. (cancelled)

26. (previously presented) The anode of claim 40 wherein said zinc alloy comprises between about 20 to 1000ppm calcium.

27. (cancelled)

28. (cancelled)

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29. (cancelled)

30. (cancelled)

31. (cancelled)

32. (cancelled)

33. (cancelled)

34. (cancelled)

35. (cancelled)

36. (cancelled)

37. (cancelled)

38. (cancelled)

39. (cancelled)

40. (presently amended) An anode for an electrochemical cell comprising a battery grade zinc powder comprising intertwined zinc metal or zinc alloy particles, said zinc metal or zinc alloy particles having a length between 8 and 22 times the diameter and a particle size distribution with a log normal slope of 2, the zinc powder being suspended in a fluid medium.

41. (original) The anode of claim 40 wherein said fluid medium is a gelled KOH electrolyte.

42. (original) The anode of claim 41 wherein said gelled KOH electrolyte comprises 98% by weight of KOH 40%/ZnO 3% and 2% by weight of a gelling agent.

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43. (previously presented) The anode of claim 42 wherein said gelling agent is polyacrylic acid.

44. (withdrawn) An electrochemical cell comprising a cathode, an anode comprising the battery grade zinc powder of claim 5 and a separator electrically separating said cathode from said anode.

45. (withdrawn) The electrochemical cell of claim 44 wherein said cathode comprises manganese dioxide, wherein said fluid medium is a gelled KOH electrolyte and further comprising a current collector inserted into said anode.

46. (withdrawn) The electrochemical cell of claim 45 wherein said gelled KOH electrolyte comprises about 2% by weight of a gelling agent.

47. (withdrawn) The electrochemical cell of claim 46 wherein said gelling agent is a polyacrylic acid.

48. (withdrawn) The electrochemical cell of claim 47 wherein said polyacrylic acid is Carbopol™ 940.

49. (withdrawn) The electrochemical cell of claim 44 wherein said separator is fabricated from a material selected from the group consisting of rayon or cellulose.

50. (withdrawn) A LR-06 electrochemical cell comprising:
a positive terminal fabricated from a conductive material;
a cathode in electrical contact with said positive terminal;
an anode comprising a battery grade zinc powder as defined in claim 5,
said zinc powder being suspended in a gelled electrolyte;
a separator electronically separating said cathode and said anode; and
a current collector inserted into said anode;

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wherein when a load of 1 ohm is placed between said positive terminal and said current collector, a cut-off voltage of 1.0 volts is reached in a time of greater than about 34 minutes.

51. (withdrawn) The LR-06 electrochemical cell of claim 50, wherein said cut-off voltage of 1.0 volts is reached in at least about 42 minutes.

52. (withdrawn) A LR-06 electrochemical cell comprising:
a positive terminal fabricated from a conductive material;
a cathode in electrical contact with said positive terminal;
an anode comprising battery grade zinc powder as defined in claim 5,
said zinc powder being suspended in a gelled electrolyte;
a separator electronically separating said cathode and said anode; and
a current collector inserted into said anode;
wherein when a current of 1 ampere is drawn by a load placed between said positive terminal and said current collector, a cut-off voltage of 1.0 volts is reached in a time of greater than about 36 minutes.

53. (withdrawn) The LR-06 electrochemical cell of claim 52, wherein said cut-off voltage of 1.0 volts is reached in at least about 45 minutes.